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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/812,879 | 03/31/2004 | Seichi Okamura | 251213US2 | 4548 |
| 22850 | 7590 | 11/27/2006 | EXAMINER | |
| C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | CHRISTENSEN, RYAN S | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2856 | |

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/812,879 | OKAMURA, SEICHI |
| | Examiner Ryan Christensen | Art Unit 2856 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 31 March 2004.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-7,11,12,16-18 and 20 is/are rejected.
 7) Claim(s) 8-10,13-15 and 19 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 3-31-05

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claims 1, 18, and 20 are objected to because of the following informalities: "implemented by" is unclear. Please use something like "wherein the sample includes/comprises/contains..." Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 16-18 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication 2003/0141456 (McNeal et al.).
5. With respect to claims 1, 18, and 20 McNeal et al. discloses an interface detection apparatus (abstract) for detecting the position of a hidden interface between first

and second materials (abstract and paragraphs 0016-0017, the interface is "hidden" in that it can be obstructed by a label), the first material having a different physical property from the second material (paragraph 004), comprising: an irradiation mechanism configured to irradiate an electromagnetic wave onto a sample (203, Fig. 2) implemented by the first and second materials; a detection mechanism configured to detect the electromagnetic wave that has passed through the sample (207, Fig. 2); and a traveling mechanism configured to change the relative position of the hidden interface with respect to the position of the detection mechanism (403, Fig. 4).

6. With respect to claim 16, the signal is passed to a personal computer (407, Fig. 4) where it is analyzed in order to determine the interference location (also see Fig. 6).
7. With respect to claim 17, the data processor records a relationship between transmitted powers of the electromagnetic wave and relative positions of the detection mechanism (See Fig. 6).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 2-7, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0141456 (McNeal et al.) in view of U.S. Patent 6,853,199 (Noïk et al.).

11. With respect to claim 2, McNeal et al. disclose an interface detection apparatus (abstract) for detecting the position of a hidden interface between first and second materials (abstract and paragraphs 0016-0017, the interface is "hidden" in that it can be obstructed by a label), the first material having a different physical property from the second material (paragraph 004), comprising: an irradiation mechanism configured to irradiate an electromagnetic wave onto a sample (203, Fig. 2) implemented by the first and second materials; a detection mechanism configured to detect the electromagnetic wave that has passed through the sample (207, Fig. 2); and a traveling mechanism configured to change the relative position of the hidden interface with respect to the position of the detection mechanism (403, Fig. 4).

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12. McNeal et al. do not explicitly disclose the distance between the irradiation mechanism and the detection mechanism is less than 15 times the wavelength of the electromagnetic wave
13. Noïk et al. disclose a system for determining the interferences in a fluid, by transmitting electromagnetic waves in at the microwave frequency rather than the infrared frequency. Like McNeal, Noïk et al. take a number of measurements at various heights in the fluid in order to determine the location of interfaces. Noïk et al. disclose the distance between the irradiation mechanism and the detection mechanism is less than 15 times the wavelength of the electromagnetic wave (Col. 2, lines 11-21).
14. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by McNeal et al., by transmitting and detecting microwaves as opposed to infrared, as disclosed by Noïk et al., because they are both known in the art for the same purpose of detecting liquid interfaces (See MPEP 2144.06). It further would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system by placing the emitter and receiver less than a certain distance apart, as disclosed by Noik et al., because the courts have held optimization of ranges not to be an inventive step (See MPEP 2144.05)
15. With respect to claim 3, Noik et al. further disclose the microwaves are generated by an oscillator (microwave source, 16) and a radiation antenna (emitter, 13)

electrically connected to the oscillator, configured to radiate the electromagnetic wave onto the sample.

16. With respect to claim 4, Noik et al. further discloses a detection antenna (15, Fig. 1) configured to receive the electromagnetic wave; and a detector electrically (17, Fig. 1) connected to the detection antenna, configured to detect information relating to the interface carried by the electromagnetic wave.
17. With respect to claim 5, both horn antennas and loop antennas are well known for generating electromagnetic waves.
18. With respect to claim 6, loop antennas are known in the art for detecting microwave signals.
19. With respect to claim 7, the combination as applied to claim 3 does not explicitly disclose the circumference length of the loop antenna is smaller than the wavelength of the electromagnetic wave, however it is well known in the art that antenna loop diameter effects the operational parameters of the antenna. It would have been obvious to one of ordinary skill in the art at the time of the invention to set the loop diameter/circumference in order to have the receiving antenna pick up the transmitted signal because the courts have held optimizing a range not to be an inventive step. (See MPEP 2144.05).
20. With respect to claim 11, the combination as applied to claim 3 discloses a transmitter side cable connecting the radiation antenna to the oscillator (unlabeled line, Fig. 2).

21. With respect to claim 12, the combination as applied to claim 4 discloses a detector side cable connecting the receiving antenna to the detector (unlabeled line, Fig. 2).

Allowable Subject Matter

22. Claims 8-10 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

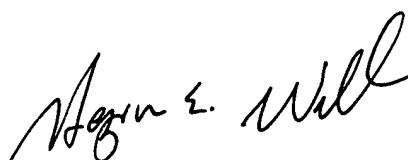
Pertinent Prior Art

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
24. U.S. Patent 2,982,170 (Wyss) discloses an electromagnetic apparatus for determining the interface between two materials by moving an electromagnetic source and detector along a container, where the electromagnetic waves are passed through the container in order to locate the interfaces.
25. U.S. Patent 3,499,154 (Boyd) discloses an apparatus for locating a hidden interface between two materials with electromagnetic waves, where the electromagnetic wave are applied up and down exterior surface of the container.

Conclusion

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Christensen whose telephone number is 571-272-2683. The examiner can normally be reached on Monday - Friday, 8am - 5pm.
27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RC



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